

# Just Enough Precision

Smart Specification  
using intentional imprecision and rich definitions



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## Agenda

- ◆ Human communication
- ◆ Intentional imprecision
- ◆ Common definitions
- ◆ Rich definitions
- ◆ Frequently needed definitions
  - derived conditions
  - quality profiles
  - action contracts
- ◆ Recommendations and resources

We are **analog beings** trapped in a **digital world** [and we did it to ourselves]. We have constructed a set of artificial devices that are very much **NOT in our own image**  
-- Don Norman



Needs, Desires,  
& Preferences



Implemented  
Systems



**Ambiguous  
Inconsistent  
Incomplete**

**Precise  
Consistent  
Complete**

## Intentional Imprecision is Smart

### Intentional Imprecision –

Reqs provider states high-level needs  
and then expects supplier to:

- (1) **lead** the discovery of details
- (2) **request** opinions on choices (with costs)

**Example:** Product manager writes – Our next generation chromatograph must have a faster <**TIOK**> cycle time than our fastest current model

Intentional imprecision is appropriate when:

- (1) supplier knows as many or more details than provider
- (2) neither supplier nor provider know details

Intentional imprecision, both **permanent** and **temporary**, should be **marked**. Consider **IOK** and **TIOK** as markers

## Just Enough Precision

Reqs are part of **interactive communication** between reqts providers and solution suppliers



## Understanding Should Determine Details

Shallow PU	5 %	Agile	Research NOT Dev
	5 - 15 %	30 - 35 %	Agile
Moderate PU	5 - 25 %	45 - 55 %	70 - 85 %
Deep PU	5 - 25 %	45 - 55 %	70 - 85 %
	Deep SU	Moderate SU	Shallow SU

**Provider Understanding (PU)** of problem domain and specific needs, wants, and preferences

**Supplier Understanding (SU)** of solution domain and relevant solutions

**requirements content: % of necessary details**

## Secondary Drivers

As well as supporting supplier understanding,  
**details may be needed** for:

- ◆ customer consensus
- ◆ third-party testers
- ◆ government regulations
- ◆ legal considerations

## Sooner or Later

Precision is painful for many,  
but **always** appears in systems development

The issue is not **if** it will appear,  
but **who** provides it and **when**

## Fixing Vague Terms

When accidental imprecision is detected

- ◆ Delete
- ◆ Replace
- ◆ Enhance
- ◆ Illustrate
- ◆ Define
  - plain
  - rich

## Plain Definitions are Imprecise

**Risk:** a **potential** source of **significant** harm or loss

Plain definitions define words using **phrases and sentences**.

Most plain definitions **do not enable precise calculations or decisions**.

Plain definitions **are sufficient** for some words.

## Plain Definitions are Not Enough

**Accurately identify potential customers  
for our new order entry system**

**Dictionary definitions** (standard context-free meanings)  
e.g. **potential** – expected to become or be

**vs.**

**Contextual** (but still plain) **definitions** (meaning as a  
function of associated words)

- e.g. **potential customer** – a person or organization,  
who is not a customer now, but may become one
- e.g. **potential increase** – an increase (in the price of  
gas) that may occur

## Precise Contextual Definitions

**Accurately identify potential customers  
for our new order entry system**

Need **precise** contextual definitions for:

- **potential customers**
- **identify potential customers**
- **accurately identify potential customers**

## Need Rich Definitions

Patterns	Objects	Examples
Entity profile	Nouns, unmodified	customer
	Nouns, modified	VAR controller
Derived value	Nouns, modified	employee bonus
<b>Derived condition</b>	Nouns, modified	potential customer
	Verbs, premodified	rarely fail
Quality profile	Nouns, modified	satisfied customer
	Verbs, premodified	accurately identify
Action contract	Verbs, postmodified	display complaints
	Verbs, premodified	tentatively identify
Derived tasks	Verbs, postmodified	plan vacation
Event profile	Events	accurately identify potential customers for our new system

## Derived Conditions (modified nouns and verbs)

**Derived conditions** name groups of one or more logical expressions (joined by *ANDs* and *Ors*)

**potential customer** =

*bought-many-services or  
bought-services-A-and-B or  
bought-a-lot-of-service-C*

**bought-many-services** =

*total-invoiced-service-types > 5*

**bought-services-A-and-B** =

*invoiced-for-service-A and invoiced-for-service-B*

**bought-a-lot-of-service-C** =

*invoiced-amount-for-service-C > \$500,000.00*

## Defining Simple Conditions

Derived conditions can define:

- account is *delinquent*
- account is *overdrawn*
- book is *overdue*
- item is *backordered*
- food is *outdated*
- *customer is a senior*

## Defining Triggers

Derived conditions can define action triggers:

*water too high* =  
level above 100 meters for 4 seconds

*platform failure* =  
*power failure*  
or *hardware failure*  
or *communication failure*  
or *system software failure*

## Derived Condition Table

Input is a "reservation locator"

1	res confirm #			
2	Flight date	departure airport	flight #	freq. flyer #
3	Flight date	departure airport	flight #	passenger name
4	Flight date	departure airport	destination airport	freq. flyer #
5	Flight date	departure airport	destination airport	passenger name

## Another Derived Condition Table

Primary operator is in class #

<i>subject</i>	<i>predicate set</i>	1	2	3	4
PO age	integer ranges	$\geq 25$	$< 25 \geq 21$	$24$ or $23$	$< 24$
PO sex	[M, F]	-	M	M	F
PO marital status	[M, S]	-	M	S	-
Annual business distance	integer ranges	$> 4800$ km	-	-	-
<b>Operator class</b>		07	09	13	13

PO = primary operator of a vehicle

## Need Rich Definitions

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## Quality Profiles (modified nouns and verbs)

Identify

1. a **subjective quality attribute**
2. a **measure** of that attribute
3. an associated **process** for measurement
4. a **method** for interpreting the results such as division of results into ranges to define satisfactory and unsatisfactory outcomes.

## Example of Quality Profile

ID	QS-1.1
ATTRIBUTE	<b>System Learnability</b> – ease of learning to use the system effectively
MEASURE	Time (in minutes) required by novice subjects (with no prior exposure to our website and less than 6 months experience with web applications) to successfully complete a 1-item order (assisted only by the online help system)
METHOD	Time at least 100 novice subjects during user interface testing
MINIMUM	Less than 10 minutes for at least 80% of the novice subjects
GOAL	Less than 7 minutes for at least 80% of the novice subjects
Stretch	Less than 5 minutes for at least 80% of the novice subjects
Past [current system]	11 minutes for 80% of all users ← recent site statistics

## The Hard Part

Identifying measures for highly subjective concepts, for example:

“The system should be fronted by an efficiently navigable, imaginatively designed, attractively laid out and secure web site that ...”

1. Answer the question: How will we know when we succeed?
2. Collect examples and counterexamples and find patterns
3. Consider prototyping
4. Consider deletion

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## Action Contracts (verbs)

The **meaning** of a function can be defined by the consequences of both valid and invalid *requests for service*.

What conditions are TRUE after the request that were not TRUE before? What conditions characterize the request?

**Action contracts define** the meaning (i.e., consequences) of a function or process using **post, pre, during, and constant conditions**

## Process Conditions

- ◆ **Constant condition**  
A condition that is TRUE at the beginning, during, and after a correct process i.e. its truth value does not change
- ◆ **Pre-condition**  
A condition that must or may be TRUE at the beginning of the process, but may become FALSE during the process
- ◆ **Post-condition**  
A condition that is TRUE after a correct process, but is FALSE or undefined at the beginning of the process
- ◆ **During condition**  
A condition that becomes TRUE during the process, but is FALSE or undefined at the beginning of the process. The condition may have any truth value after the process. [A during condition that is TRUE after the process is a post-condition.]

## Action Contract -- Example

pre & post conditions for a set of actions

### Process order

Order Quantity	On Hand Quantity	On Hand vs. Order	Post-Conditions
Invalid	---		Invalid quantity reported
Valid	Out	[Short]	Backorder created
Valid	In	Short	Backorder created & Partial order ticket created
Valid	In	Enough	Full order ticket created

## Action Contract - Example

### Get Seat on Reserved Flight

Global Constant Conditions

For res system, status is active

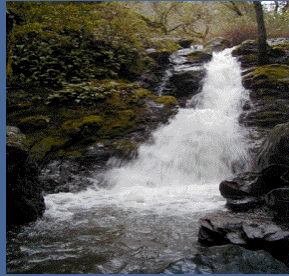
For passenger, system access status is signed on

Rule #	Res locator info	Res found	Seat assignment	Main Result	Thanked	Advised
1	valid	found	already assigned	seat assigned	yes	
2	valid	found	assignable	seat assigned	yes	
3	valid	found	not assignable	request queued	yes	yes
4	valid	not found			yes	yes
5	valid					yes

## Need Rich Definitions

Patterns	Description
<b>Entity profile</b>	Defines nouns using their attributes, data types, and relationships to other nouns
<b>Derived value</b>	Defines noun phrases <b>using a cascade of algebraic formulas</b>
Derived condition	Defines noun and verb phrases <b>using a cascade of logical expressions</b>
Quality profile	Defines subjective noun and verb phrases by specifying measures, measurement processes, and levels of accomplishment
Action contract	Defines verb phrases using pre and post conditions
<b>Derived tasks</b>	Defines verb phrases <b>using a cascade of "work breakdown" definitions</b>
<b>Event profile</b>	Defines an event by answering the "reporter questions" (what, who, when, where, why)

## Mixed Cascades



- Each derived (condition, value, and task) definition uses a cascade of patterns
- Cascades contain one or more patterns
- Multipattern cascades can be *pure* (i.e., all the same patterns) or *mixed*

A mixed cascade:

```
employee bonus = If is-executive, executive bonus
                  Elseif is-manager, manager bonus
                  Else staff bonus Endif
is-executive = (job-title = CEO or CFO or CTO or ...)
```

## Value of Rich Definitions

- ◆ Rich definitions  
catalyze crucial conversations
- ◆ Their value is directly related to the challenge of their creation  
i.e. easy = low value  
hard = high value

## Recommendations

### Be Smart

Use rich definitions of key phrases  
to introduce precision early

Use and mark  
intentional imprecision

## Resources

Slides – Just Enough Precision  
Slides – Let Me Be Perfectly Clear  
Paper – Using Rich Definitions to Improve Customer  
Communication  
Word Template – Rich Glossary Template  
  
Video – StyleWriter and TEKchecker Movie (fun)  
User Guide – TEKchecker User Guide

Resources freely available at  
[www.clearspecs.com](http://www.clearspecs.com)

## Thanks For Attending

Contact Dave with [questions](#) and [comments](#)

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